

Battling a Coral Disease in the Florida Keys National Marine Sanctuary

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NOS / NOAA / FKNMS

In the mid-1980s, a major outbreak of black band disease occurred in the Florida Keys, especially at the coral reefs in the Looe Key National Marine Sanctuary. Sanctuary managers were frustrated by the killer that was gradually overwhelming the majestic framework-building mountain star corals and brain corals. At the time, Sanctuary biologist Harold Hudson was determined to develop a technique to halt the progress of the disease. After experimenting with various ideas, he settled on an effective and inexpensive technique that uses an airlift to vacuum the black band from a coral head into a holding tank. Next, the treated area of exposed coral skeleton is capped with modeling clay to smother any remaining bacterial filaments. The bacteria are then brought ashore and destroyed to eliminate the potential re-infection of nearby corals. Hudson's technique appeared to successfully halt the immediate spread of the disease, but the long-term effects of the treatment were not adequately monitored.



Black band on Colpophyllia natans

Much has been discovered about the nature of black band disease, which was first documented in the early 1970s by scientists. The disease is initiated by a

cyanobacterium, *Phormidium corallyticum*, which resides in sediment depressions on a coral head. As summer approaches, rising sea temperatures promote the growth of this photosynthesizing bacterium. The mature stage of black band disease consists of a consortium of bacteria that infects injured coral heads and progressively smothers coral tissue. The bacteria are noticeable as a dark-purple, brown line that separates the margin of living coral tissue and dead skeleton. It is a virulent disease that can decimate large coral colonies over a period of several months.

Nearly a decade after the initial outbreak at Looe Key, another wave of black band assailed the reefs of the Keys. In response to the renewed threat of the disease, another attempt to combat black band was begun by the staff of the Florida Keys National Marine Sanctuary (FKNMS). Preventing coral degradation by treating coral diseases falls within the resource management responsibilities of the FKNMS. The mission of the Florida Keys National Marine Sanctuary is to conserve and enhance the biodiversity, ecological integrity, and cultural legacy of the marine resources surrounding the Keys. The incursion of black band endangered the unique coral reefs that prompted the designation of the Sanctuary in 1990. The National Oceanic and Atmospheric Administration (NOAA) and Florida Department of Environmental Protection (DEP) cooperatively manage the marine resources within the 2800 square nautical miles of the FKNMS.



Capping coral with modeling clay.

A three-year program to treat black band disease within the Sanctuary was established with funding from the National Marine Fisheries Service to the Florida DEP and the FKNMS. During the first year of the program in 1998, a total of 10 coral heads infected by 71 active black bands were treated. The total length of black band disease treated equaled approximately 60 feet. Linear spreading rates of black band disease have been recorded at about 1/8" per day. At this rate, the total length of black band treated could consume about 19 square feet of live coral tissue per month. This estimate provides a glimpse of the potential influence that black band disease has on the structure of coral reef communities.

Up until press time, the treated coral heads had not been re-infected. The corals have been tagged and will be monitored to assess the effectiveness of the technique. If the technique continues to be successful, a more intense treatment program will be pursued during 1999. As the summer approaches, Sanctuary staff is again preparing to quell the black band invasion and protect the precious marine resources of the Florida Keys National Marine Sanctuary.

If you wish to learn more about the activities that occur within the Florida Keys National Marine Sanctuary or would like to become involved with a project, visit the FKNMS web site at www.nos.noaa.gov/nmsp/fknms.

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